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PATENT OF INVENTION

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Title: CLEANING TOWEL

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BE-855,362

The present invention is concerned with a cleaning towel, made of a non-woven fabric, water-resistant crepe paper, or analogous materials, this towel containing an active washing agent. Cleaning towels of this type are destined, in particular, for household use, but they can also be employed for the cleaning of windshields of vehicles, for the cleaning of offices and also possibly for the maintenance of machines and apparatuses in industrial installations.

According to Utility Model No. 1,884,410 of the German Federal Republic (BRD), a towel is known for the cleaning of windows, this towel consisting of an absorbent fabric completely impregnated with an emulsion of a nonionic soap, of a cleaning agent and a support. In this Utility Model, for example, sodium salt of an ether sulfonate of a fatty alcohol is proposed as the nonionic soap,* while methylcellulose is proposed as the support. With cleaning towels of this known type, it is difficult to apply a sufficient deposit of the active washing substance, because the water-soluble fixing agent required evidently diminishes the concentration of this substance.

A cleaning towel carrying a deposit of a washing agent which is sufficient for several applications is known, for example, according to Utility Model No. 75 ??** 821 of the German Federal Republic. The cleaning towel described in this Utility Model carries one or several layers of the deposit, in which the active washing agent is fixed with the aid of organic binders which are insoluble in water, at least the plane surfaces of the deposited layers being covered by porous layers. According to this proposition, the layers of the deposit themselves consist of a nonwoven fabric or of a soft open-cell foam, while the water-insoluble organic binders are, for example, synthetic powders of thermoplastic synthetic materials, waxes, high-molecular hydrocarbons or similar materials. It was observed that towels prepared with a deposit of this type can in fact be used several times without a great reduction of the cleaning power. On the other hand, towels of this type are evidently more expensive, so that they are less appropriate, in particular, for a single use.

*This is not nonionic! - Translator

**These numbers are illegible. - Translator

During the manufacture of cleaning towels carrying a deposit of a cleaning agent, another problem arises:

The more active washing agent is incorporated into the relatively thin towel, the more rigid this towel becomes, with the result that finally it becomes as rigid as a board and essentially loses its initial textile-like touch. According to the state of the art, one can avoid this drawback by charging the towel with a "diluted" active substance (Utility Model No. 1,884,410 of the German Federal Republic). Another possibility of avoiding this disadvantage consists in making a towel of several layers, which is many times more expensive.

Starting from this state of the art, we propose a cleaning towel carrying a deposit of a washing agent, which can be made economically and preserving the textile-like touch, even when it is made of only one layer and even though one can incorporate into it practically any amount of the active washing agent in doses introduced conveniently.

For this purpose, according to the invention, the active washing agent is distributed on or in the cleaning towel in the form of a design. In this case, the design of the active washing substance may have the form of lines, in particular, curved lines. However, one can also distribute the active washing substance in any other way, namely, in the form of dots, stars, circles or analogous configurations, distributed uniformly or irregularly. The designs can also be applied in any combination. In any case, they offer the advantage of the fact that the towel thus treated has sufficient zones which are exempt of the active washing agent, and as a result of this, the towel as a whole remains flexible and consequently retains its textile-like character.

Towels of this type destined for a single use are generally made of wet-strength papers, in particular, crepe paper with wet strength. However, the towels may also be made of nonwoven fabrics or, possibly, when one forms several layers, one can use a combination of these starting materials. Finally, one can also use a soft foam as a complement or as the only layer, which is then charged with the active washing substance in the manner indicated above.

According to a special mode of construction of the cleaning towel, only a partial area of the towel is charged with the active washing substance, this area being separated from the uncharged partial area of the towel by a boundary made of a hydrophobic substance. A towel of this type has the advantage that during the impregnation it can be used in the usual manner as a towel for the distribution of the active substance, while after the cleaning one still has a complementary surface free from the active cleaning substance, which is suitable for a final cleaning without the contribution of the active washing agent. The barrier between the two partial areas of the towel, mentioned above, is necessary in order to prevent the diffusion of the active washing agent into the other, uncharged, parts of the napkin after saturation with water. As the hydrophobic substance to form the barrier, one can use, preferably, a water-insoluble synthetic material, which is resistant to abrasion and which is soft as textiles are, for example, a synthetic material which can be prepared starting from an acrylate. Similarly, hardened silicone resins are particularly well suited for this purpose. These synthetic materials may be applied to the towel in solution or also in the form of polymers, to be hardened afterward by a thermal treatment.

In addition, one can use various natural materials to form the barrier between the two areas of the cleaning towel. As preferred examples, we shall mention natural rubber or shellac. Natural rubber may be applied in the form of solutions in organic solvents, such as benzene, toluene, or xylene. Shellac is used in the form of aqueous dispersions and, in fact, in a form which is known itself, which becomes insoluble in water after drying.

In principle, the application of the active washing substance in the form of a design can be carried out in any manner. However, it was observed that it is particularly advantageous to apply the active washing substance in the molten state onto the towel or band. In this case one can proceed in the following manner: The active washing substance is applied in the molten state in the form of a design to an endless band of a nonwoven fabric, a wet-strength crepe paper or similar material, and then, after solidification of the active washing substance, the band is cut into several towels which are then packaged individually or in groups. The application of the molten active washing

substance can be carried out by pressure or also by applying the molten material onto the towel by impregnation with the aid of at least one small applicator tube, for example, a heated pipet. In the manufacture of the towels, one can juxtapose many heated pipets of this type, which one raises and lowers together with the aid of an appropriate installation, a small amount of the molten active washing substance being transferred to the towel each time.

Similarly, proceeding in this way, one can form curved lines or similar structures by, for example, placing the pipets into a common support, in the form of a bar, which is subjected to perpendicular oscillations in the direction of the threading of the band.

In carrying out this process, it is particularly important to have a fusible mixture of the active washing substances, which form a molten mass with low viscosity at a relatively low temperature, and also, solidifying afterwards easily and rapidly after it has been applied to the band. A fusible mixture of active washing substances of this type, which is particularly appropriate for the manufacture of cleaning towels, has the following composition:

- 40-60% by weight of nonylphenylpolyglycol ether with a degree of ethoxylation of about 30 (content of active washing substance: practically 100%);
- 15-35% by weight of an ethoxylate of a stearic alcohol, containing about 80 moles of ethylene oxide per mole (content of active washing substance: practically 100%);
- 10-30% by weight of a sodium salt of the half ester of sulfuric acid with a mixture of coconut fatty alcohol (content of active washing substance: about 90%);
- 0.5-5% by weight of the monoethanolamide of lauric acid (amide content: about 92-96%).

Mixture of active washing substances of this composition have a melting point of about 60-80°C. In the molten state, they form a clear liquid, like water, the viscosity of which is approximately between those of glycerol and of a fine oil at 20°C. This mixture offers the advantage of being essentially insensitive to overheating, with the result that it can be used perfectly in mass production.

Moreover, due to the composition indicated, according to our current knowledge, the active washing substance is physiologically acceptable and perfectly compatible with skin. Moreover, it does not attack the usual raw materials used in domestic operations, in the construction of automobiles and in industrial installations. This remark is equally valid when final cleaning is omitted and when consequently, the residues of the active washing substance remain on the cleaned surfaces. Finally, as an additional advantage, it should be underlined that the mixture of washing substances indicated above is biodegradable with the result that in the amounts planned in the present case, they do not cause any pollution in our waste-water discharge systems.

Some forms of the execution of the cleaning towel proposed according to the invention will be described below in more detail, referring to the attached drawings, in which:

Figure 1 is a top view of a form of execution of a cleaning towel, the entire surface of which is charged with an active washing substance;

Figure 2 represents a form of execution in which only a part of the surface of the towel is charged with an active washing agent.

The cleaning towel represented in Figure 1 consists of one or more layers 1 of a nonwoven fabric, of wet-strength crepe paper or similar material. Layer 1 is charged with an active washing substance 2, applied in the form of a design. Figure 1 shows that the active washing substance can be applied whether in the form of curved lines or in the form of small circles. Such designs can be easily obtained by a printing process or equally, by other methods.

Figure 2 illustrates another form of execution of the towel in which only a partial area is charged with the active washing substance, this area being separated from the uncharged partial area 5 with the aid of barrier 4. The active washing substance is present in partial area 3, in the form of straight lines which cross, and also in the form of dots, distributed in a regular manner in the squares formed by the above lines. In the example shown, the barrier 4 consists of two lines designated 4' and 4'', these lines being made from a

synthetic hydrophobic material, which is insoluble in water, resists abrasion and possesses the flexibility of textile materials.

PATENT CLAIMS

1. Cleaning towel, made of a nonwoven fabric, wet-strength crepe paper or analogous materials, containing an active washing substance, characterized by the fact that the active washing substance is distributed in the form of a design on or in the cleaning towel.

2. Cleaning towel according to Claim 1, characterized by the fact that the design of the active washing substance is in the form of lines, in particular, of curved lines.

3. Cleaning towel, according to Claim 1, characterized by the fact that the design of the active washing substance is in the form of dots, stars, circles or similar configurations distributed uniformly or irregularly.

4. Cleaning towel, according to Claim 1, characterized by the fact that only a partial area (3) of the towel is charged with an active washing substance, this area being separated from the uncharged partial area (5) of the towel by a barrier (4) consisting of a hydrophobic substance.

5. Cleaning towel according to Claim 4, characterized by the fact that the barrier (4) consists of a hydrophobic synthetic material, which is insoluble in water, resists abrasion and has the flexibility of textile materials.

6. Cleaning towel according to Claim 4, characterized by the fact that the barrier (4) consists of a natural rubber or of natural resins, such as shellac or similar materials.

7. Process of manufacture of a cleaning napkin according to Claim 1, characterized by the fact that the active washing substance is applied in the molten state and in the form of a design onto a band of a woven or nonwoven fabric, of a wet-strength crepe paper or analogous materials, this band being subsequently subdivided into individual towels after the solidification of the active washing substance.

8. Process according to Claim 7, characterized by the fact that the active washing substance is applied under pressure in the molten state.

9. Process according to Claim 7, characterized by the fact that the application of the active washing substance in the molten state is carried out by impregnation with the aid of at least one small applicator tube.

10. Fusible mixture of active washing substances for the manufacture of a cleaning towel according to Claim 1, characterized by the fact that it has the following compositions:

40-60% by weight of nonylphenylpolyglycol ether with a degree of ethoxylation of about 30;

15-35% by weight of an ethoxylate of a stearic alcohol, containing about 80 moles of ethylene oxide per mole;

10-30% by weight of a sodium salt of the half ester of sulfuric acid with a mixture of coconut fatty alcohol;

0.5-5% by weight of the monoethanolamide of lauric acid.

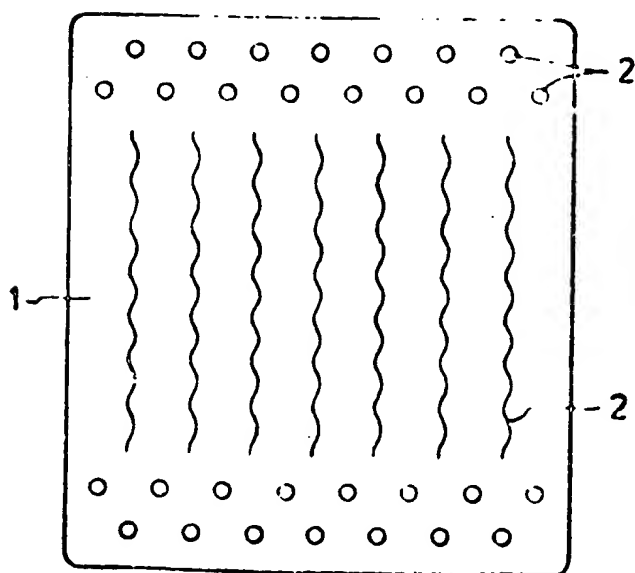


Figure 1

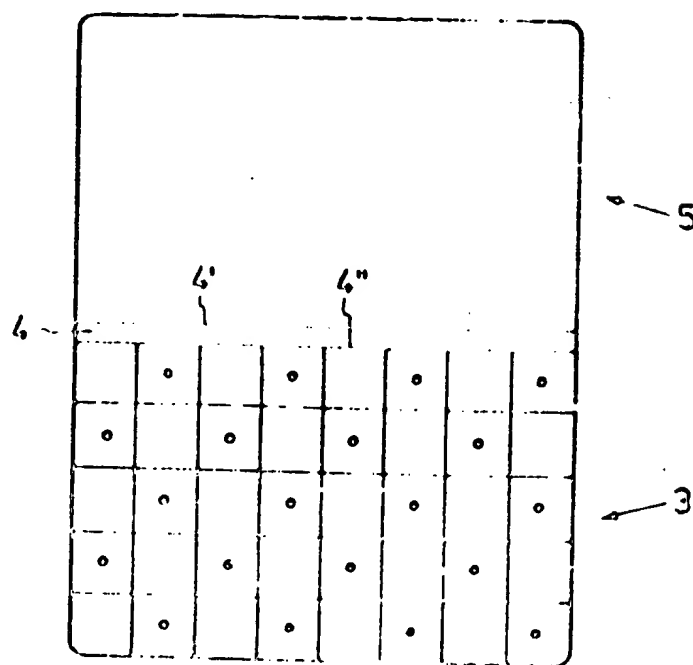


Figure 2

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<p>70780Y/40 VER PAPIERW SCHICKEDANZ 04.06.76-DT-625176 (03.10.77) A471 Hydrophobic paper or textile cleaning cloths - impregnated with cleaning agent as a printed design</p>	<p>A(10-E8A, 10-E8B, 12-W12B) D(11-A1A, 11-A1F, 11-A3, 11-A7, 11-D1) E(10-A9A, 10-D3D, 10-E4M) F(2-C1, 3-G, 4-D, 4-E, 5-A6B).</p>
<p>A cleaning napkin made of non-woven cloth, crepe paper resistant to moisture or analogous material contains a washing agent distributed in the form of a design on or in the napkin. Washing agent is applied in molten form to a band of the napkin material. After solidification, the band bearing the design is divided into individual cloths.</p> <p>A fusible washing agent compsn. (A) for the napkin contains 40-60% of nonylphenol 30 times ethoxylated; 15-35% of an ethoxylated tallow fatty alcohol contg. 80 mols ethylene oxide/mol; 10-30% of the sodium salts of a mixture of sulphated coco fatty alcohols and 0.5-5% of lauric acid mon ethanolamide.</p> <p><u>USE/ADVANTAGE</u> The napkins are particularly useful for household purposes, but may also be used in office and industrial cleaning. The napkin is cheaper than previous types, can carry sufficient cleaning agent and at the same time remains supple, preserving its textile nature.</p>	<p><u>DETAIL</u> The design is in the form of lines, esp. wavy lines, stars, circles etc.. Pref. only a partial area of the napkin is treated with the cleaning agent and this area is sepd. from the untreated area by a border of hydrophobic substance, esp. natural rubber or natural resins such as shellac. Compen. (A) is applied in the molten state by pressure or by impregnation using a small applicator tube. Compen. (A) has a m.pt. 60-80°C and forms a clear liq. with a viscosity varying from glycerol to fine oil.</p> <p><u>EXAMPLE</u> Half a napkin is printed with compsn. (A) in a design of lines forming squares in which are spots. The area is divided from the unprinted area by a border of hydrophobic material such as those given above on a synthetic resin such as an acrylate resin or a silicone resin. The napkin can be used for cleaning using the area contg. the cleaning agent first followed by cleaning without agent using the unprinted area. (10pp597).</p>

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